Alberta
Environment

PROVINCIAL WETLAND

RESTORATION/COMPENSATION GUIDE

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Guide Intent

This guide has been written for government regulators, land developers, the public, wetland restoration agencies, and government departments whose mandates or activities affect wetlands.

It explains how applications under the *Water Act* will be reviewed when loss of wetland area will occur. It also explains wetland compensation, a process to help reduce loss of wetland area by restoring drained or altered naturally occurring wetlands.

Alberta Environment's priority is to avoid having land development impact wetland area whenever possible. When this is not an option, Alberta Environment requires developers to explore how they can reduce impacts to the wetland area or, if this is not possible, how they can compensate for the disturbance.

Compensation for the loss of naturally occurring wetlands will be required when an approval to impact a wetland is issued under the *Water Act*, and when the regulator has decided the most appropriate action is to restore a wetland.

Wetland compensation in Alberta is a process that requires the restoration of drained or altered naturally occurring wetlands. The compensation process does not allow for the development of artificial wetlands.

Wetland restoration occurs under the direction of a wetland restoration agency. The agency is responsible for collecting funds to restore drained wetlands to near natural conditions, for maintaining restored wetlands, for keeping records and reporting to Alberta Environment, and for obtaining approvals/licenses under authority of the *Water Act* and where applicable, the *Public Lands Act*.

Ducks Unlimited Canada (DUC) is currently the only wetland restoration agency in Alberta, but this does not preclude other agencies becoming involved in wetland restoration work.

Wetland restoration as compensation is one option that can be used to replace drained or altered naturally occurring wetlands. Approval applicants are welcome to make alternate suggestions that will also be considered, outside of the compensation funding process.

It should also be noted that the decision to allow any activity that may affect a wetland is discretionary. Approvals may be refused, despite the availability of compensation alternatives.

Definitions

- **Alberta Environment (AENV):** the Ministry responsible for regulating activities such as wetland mitigation and development projects that affect water bodies under authority of the *Water Act*.
- **Approval applicant:** a person(s) proposing activities in and around a wetland or considering restoring a naturally occurring wetland.
- **Artificial wetland:** a man-made wetland in an area where a natural wetland did not exist before.
- **Compensation:** payment into a fund for wetland restoration work.
- **Mitigation:** process to reduce loss of wetlands, focusing on avoiding loss, minimizing impact, and compensating for unavoidable wetland loss.
- **Naturally occurring wetland:** an area where water has or does accumulate to water elevations documented to have occurred under natural conditions.
- **Qualified Wetland Aquatic Environment Specialist (QWAES):** an expert with detailed knowledge of the aquatic environment, wetland soils, wetland species, hydrology and wetland margin habitat and their management or assessment.

  The term Qualified Wetland Aquatic Environment Specialist has been taken from the Water (Ministerial) Regulation - Code of Practice for Pipelines and Telecommunication Lines Crossing A Water Body and modified for use in this guide.
- **Restoration:** re-establishment of a naturally occurring wetland with a functioning natural ecosystem whose characteristics are as close as possible to conditions prior to drainage or other alteration.
- **Watershed:** an area of land that catches precipitation and drains it to a specific point such as a marsh, lake, stream or river. A watershed can be made up of a number of sub-watersheds that contribute to the overall drainage of the watershed.
- **Wetland:** land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity which are adapted to a wet environment.
- **Wetland area:** the flooded portion of a wetland up to and including the transition zone from aquatic to terrestrial vegetation. The same definition shall be used in the case of climatically dry wetlands.
- **Wetland loss:** includes infilling, altering, or physically draining the wetland, any impact to the riparian area and buffers strips, and any type of interference with the hydrology to and from the wetland.
- **Wetland restoration agency (WRA):** an organization responsible for restoring drained wetlands to near natural conditions. Responsibilities include securing land rights, obtaining approvals/licenses under authority of the *Water Act* and where applicable, the *Public Lands Act*, completing restoration works, operating and monitoring the restored wetlands, keeping records and reporting to Alberta Environment.

1.0 Mitigation

Mitigation is a process to reduce loss of wetland by:

- **Avoiding** impacts to the wetland;
- **Minimizing** impacts and requiring applicable compensation; and
- **Compensating for** impacts that cannot be avoided or minimized.

1.1 Understanding compensation

Compensation is required when an approval to impact a wetland is issued under the *Water Act*, and when the regulator has decided the most appropriate mitigation action is to restore or enhance an impacted area.

Wetland restoration through compensation action supports the concept of no further loss of wetland area in the province. Wetland restoration usually includes the replacement of wetland plant communities, hydrologic regimes and other functions similar to those found in a natural wetland. Restored wetlands should consist of a variety of types and sizes.

1.2 Compensation guidelines

1. Compensation will be provided through restoration of drained or altered naturally occurring wetlands.

2. Compensation should take place within the same watershed as the impacted wetland, or in a watershed close by ***(see Wetland Mitigation Compensation System Schematic - Section 2.1)***.

3. Where wetland alteration or destruction takes place within a highly impacted watershed (urban or rural), it is not always practical to restore within the same watershed.

4. Wetlands should not be restored within the projected 30-year expansion limits of urban areas unless it can be incorporated into a secure or protected system, such as a park or flood plain.

5. Off-site compensation will be allowed if altered local wetlands do not exist near the site of the development or if sites are deemed unsuitable.

6. Where an approval applicant plans to minimize the impact to the wetland, some compensation measures may still be required as determined by Alberta Environment on the recommendation of a Qualified Wetland Aquatic Environment Specialist (QWAES).

1.3 Approving restoration projects

Once the restoration is complete, the wetland will be assessed by a QWAES and classified using either the Cowardin Wetland Classification System (**Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979**) or the Stewart and Kantrud Wetland Classification System (**Stewart, Robert E. and Harold A. Kantrud. 1971**). It is important to compare the restored wetland against the destroyed or altered wetland using the same classification system. This helps Alberta Environment determine if a suitable balance is being maintained.

The Wetland Restoration Agency is responsible for determining the viability of the site(s), restoring the site(s), managing the site(s), keeping detailed records and providing Alberta Environment with an annual wetland compensation audit report, including transactions made, where compensation funds were used, wetland gains resulting from restoration efforts, site viability, and any other pertinent information.

The agency will not be permitted to construct artificial wetlands for the sole purpose of receiving compensation funds. Construction of artificial wetlands is a complicated matter as it is very difficult to replicate or mimic a natural wetland.

Alberta Environment is responsible for approving wetland restorations under authority of the *Water Act* and for approving their use as a wetland mitigation solution.

1.4 Benefits of Wetland restoration

Restoring drained or altered wetlands have many environmental and social advantages.

Wetland areas provide clean water, wildlife viewing opportunities and other outdoor recreation activities. They also conserve soil and control erosion, retain sediments, absorb nutrients, degrade pesticides, store water and moderate impacts of floods and droughts, recharge aquifers and help to moderate climate change. These wetland benefits apply to landowners as well as to society as a whole.

1.5 Benefits of the compensation approach

In the compensation approach, wetland restoration agencies are responsible for restoring and maintaining wetland areas under the authority of the *Water Act*. The agency shall be required to:

- guarantee the site meets the requirements to sustain a wetland
- manage and maintain restored wetlands
- develop and maintain an inventory of wetlands to be restored
- provide annual audit reports to Alberta Environment.

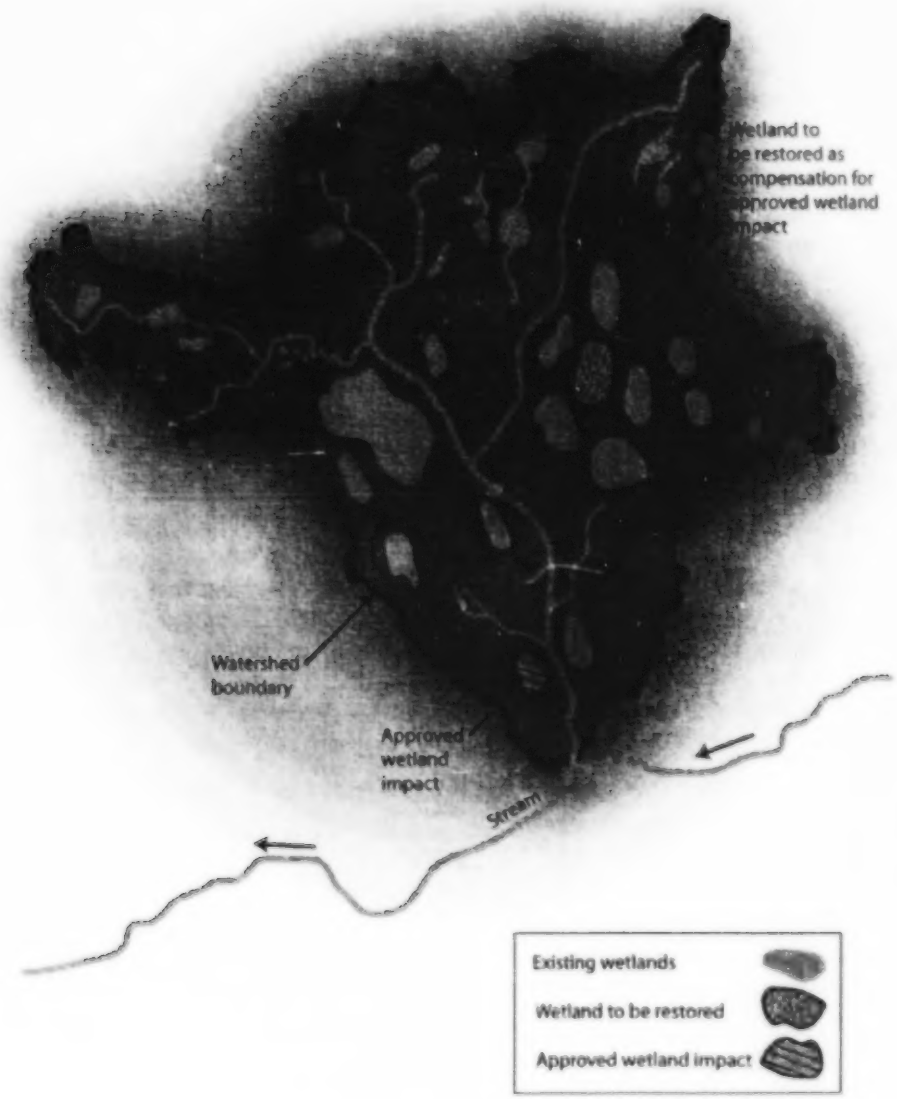
Because of their experience, wetland restoration agencies tend to be more successful in restoring naturally occurring wetlands. It is possible to restore wetlands that have been drained for 40 years or more back to almost fully functioning wetlands. The restored wetland is within watersheds that support sustainable wetland function and will be secured for a minimum of a 30-year period.

Wetland restoration agencies work to establish wetlands in remote areas or as part of a system of wetlands. These areas are more likely to offer hydrological functions and wildlife habitat than isolated, smaller wetland areas near development.

All of the compensation funds received by wetland restoration agencies are used, in addition to current resources, to support wetland restoration efforts in Alberta.

Under the compensation approach, approval applicants also benefit. Approval applicants are not responsible for the long-term management or liability of restored wetland areas. By working through an agency, the overall cost and the amount of time required for approvals is less for approval applicants than if they were to undertake individual projects. Approval applicants are recognized as being good environmental citizens.

1.6 Wetland mitigation compensation system diagram



2.0 Approval process and the use of compensation

The *Water Act* requires a person to obtain an approval for any activity that may impact wetlands. An approval applicant is expected to:

- **Avoid** damage or destruction of the wetland
- **Minimize** the impact and provide applicable compensation
- **Compensate** for the unavoidable damage or destruction

Information about *Water Act* approvals and an application form can be obtained from: http://www3.gov.ab.ca/env/water/Legislation/FactSheets/Index.cfm

It is recommended that an approval applicant first discuss their proposal with a consultant or QWAES (a QWAES may be provided by the wetland restoration agency) and local municipality. This discussion will allow the parties to explore the most economical and beneficial options available, including options to avoid or minimize the impact on the wetland.

The provincial Crown owns the beds and shores of permanent and naturally occurring wetlands. Therefore, it is important to discuss any proposal that may impact a Crown owned body of water with Alberta Sustainable Resource Development's Public Lands and Forests Division, early on in the planning process. If no alternative exists to disturbing the wetland for development, conversion of ownership must be addressed through a land exchange, sale or other mechanism. Wetland compensation would still apply.

In addition to the approval application requirements, a copy of a Wetland Impact Assessment Form, including a mitigation plan, must be filed with the Application for Approval or Licence under the *Water Act* form. The QWAES will be responsible for assessing the wetland that will be impacted (*see Wetland Mitigation Compensation System Schematic - Section 2.1*). The assessment should include, at a minimum, the following information:

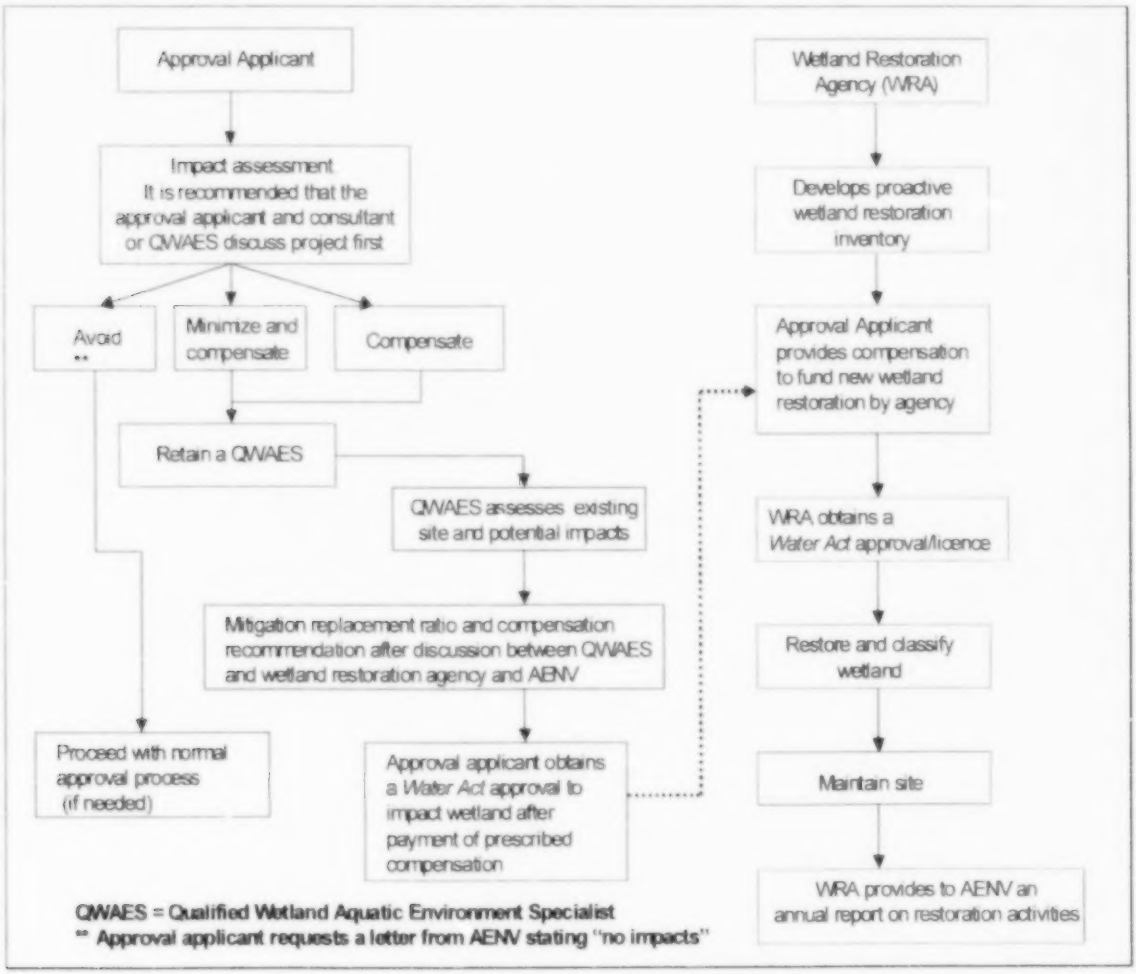
- Area of wetland (includes the flooded portion of a wetland and the transition zone from aquatic to terrestrial vegetation);
- Hydrologic assessment
- Statement of Wetland benefits
    - Hydrological
    - Ecological
    - Economical
- Classification of the wetland based on either the Cowardin Wetland Classification System or the Stewart and Kantrud Wetland Classification System
- Flora and fauna at the site, including presence of rare or endangered species
- Type of wetland margin and average width of wetland margin
- Surrounding upland use (cropping, natural, etc.)
- Drainage area contributing to the wetland site
- Historical aerial photographs
- Referenced photographs delineating the wetland area, wetland margin and immediate upland area

- A report describing the existing wetland site and the proposed development, including a statement (and supporting technical information) indicating why it is not possible to avoid or minimize the impact on the wetland. *(See Wetland Impact Assessment Form - Section 2.5)*

The recommendations in the assessment will be used by Alberta Environment during the decision-making process.

Compensation payments must be made to the wetland restoration agency before a *Water Act* approval is issued.

2.1 Wetland mitigation compensation system schematic


Approval Applicant
Impact assessment
It is recommended that the approval applicant and consultant or QWAES discuss project first
Avoid **
Minimize and compensate
Compensate
Retain a QWAES
QWAES assesses existing site and potential impacts
Mitigation replacement ratio and compensation recommendation after discussion between QWAES and wetland restoration agency and AENV
Proceed with normal approval process (if needed)
Approval applicant obtains a Water Act approval to impact wetland after payment of prescribed compensation
Wetland Restoration Agency (WRA)
Develops proactive wetland restoration inventory
Approval Applicant provides compensation to fund new wetland restoration by agency
WRA obtains a Water Act approval/licence
Restore and classify wetland
Maintain site
WRA provides to AENV an annual report on restoration activities
QWAES = Qualified Wetland Aquatic Environment Specialist
** Approval applicant requests a letter from AENV stating "no impacts"

2.2 Wetland replacement ratios

Compensation for lost wetland will be available on the basis of replacement ratios. It is almost impossible to fully replicate the complexity of a natural wetland ecosystem. For this reason, it is a generally accepted practice that a greater area (hectares) of restored wetland habitat will be required as compensation for a smaller area of destroyed natural wetland.

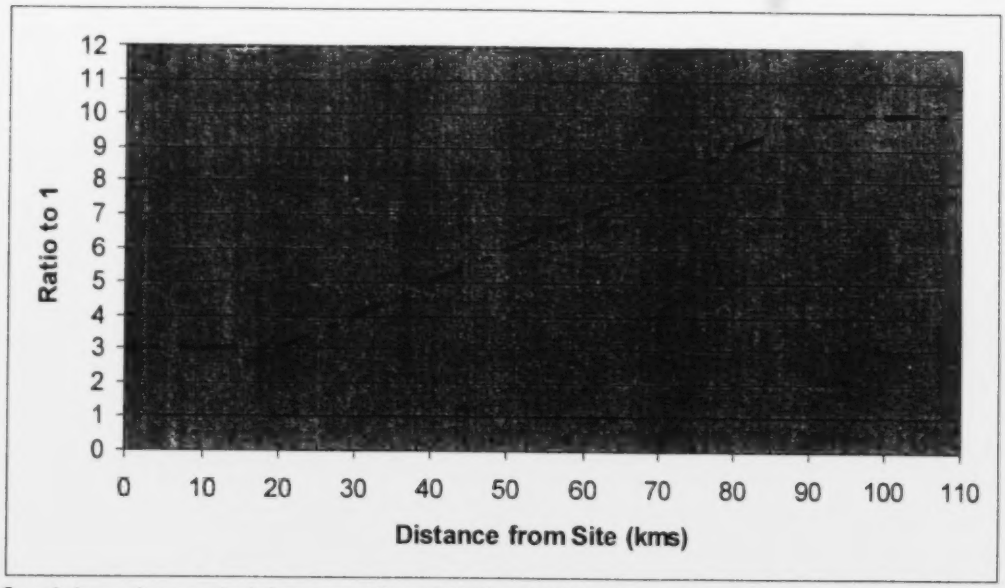
Wetland replacement ratios are numeric expressions of the ratio of wetland area replaced through restoration to wetland area lost. For example, a ratio of 3:1 means three hectares of equivalent wetland must be restored for each hectare of natural wetland impacted or lost. A minimum replacement ratio of 3:1 is commonly used. This ratio may change depending on site-specific circumstances as determined by a QWAES and subject to the approval of Alberta Environment.

Determination of replacement ratios is not an exact science. In general, the amount of replacement required is driven by a consideration of the following factors:

- Type of wetland
- Success rate of restoration for similar types of wetland
- Degree of permanency
- Distance of restoration from the impacted site
- Species present at the impacted area (including rare and endangered species)
- Importance of impacted site to native flora and fauna

The restored wetland should be an equivalent type of wetland, located in a landscape that is equally or less impacted, and offer the same degree of permanency as the impacted wetland wherever possible.

2.3 Wetland Replacement Ratios Graph



Graph based on material sourced from "Wetland Mitigation in Canada a Framework for Application".

The ratios reflect the risk involved with restoring drained wetlands especially when forced to restore outside of the local watershed. The maximum rate of compensation is 10:1 considering that most restoration sites should be in the 0 to 80 kilometres range from the impacted site. However, exceptional circumstances would have to be evaluated separately and compensated accordingly.

2.4 Wetland Mitigation Compensation Example

The following example has been included to provide a clearer understanding of the wetland mitigation compensation process:

An approval applicant is developing a site that will impact a 5 hectares wetland. Before the approval applicant submits an application for an approval under the *Water Act*, the approval applicant, with the assistance of a consultant or QWAES must have considered avoiding the wetland site altogether or minimizing the effects of development on the wetland.

If the approval applicant has taken these first two steps and is unable to avoid affecting the wetland, the approval applicant must retain a QWAES at the approval applicant's expense. The QWAES will conduct a thorough review of the site as described in Section 2.0. If the QWAES describes the wetland as an emergent freshwater wetland under the Cowardin wetland classification system and recommends to the regulator the replacement ratio be 4:1 based on the nearest wetland restoration site, which is 30 kilometres from the impacted wetland, the approval applicant then has the option of contacting the wetland restoration agency that offers emergent freshwater wetland to be restored in order to compensate for 20 hectares of wetland loss (5 hectares destroyed at replacement ratio of 4:1 = 20 hectares).

The wetland restoration agency would invoice the approval applicant for 20 hectares based on the cost of restoring the same type of wetland (e.g. land acquisition, including upland area and wetland margins, cost of restoration work, cost of monitoring the site and an administration fee if necessary). The cost may vary depending on the type, size, location, land securement costs and restoration development.

The approval applicant is responsible for funding a 20 hectares wetland.

If the agency has a 40 hectares wetland planned for restoration at a cost of $140,000 including land purchase, restoration work, monitoring/maintenance and an administration fee. The cost per hectare would be:

Land acquisition:	$75,000
Restoration work:	$50,000
Monitoring/Maintenance:	$10,000
Administration fee	$5,000
Total:	**$140,000**

$140,000/40

Unit Cost **$3500 per hectare**

The approval applicant's "funding" will be put towards restoring 20 hectares of the 40 hectares restoration project. If it costs $3,500 per hectare for the 40 hectares restoration project then it will cost the approval applicant $70,000 (20 hectares x $3,500 = $70,000). The WRA will apply the $70,000 directly toward restoration of 20 hectares of the 40 hectares restoration project. Once the wetland restoration agency has sufficient funds in place then the agency will proceed with restoring the 40 hectares wetland site. The agency is at liberty to include funds from other sources to complete the wetland restoration project.

This is purely an example and it should be noted that land values vary throughout Alberta.

The wetland restoration agency would be responsible to report to the approval applicant on how the funds were used and on the type of restoration work that took place.

2.5 Wetland Impact Assessment Form

The purpose of the Wetland Impact Assessment form is to provide guidance and consistency in reporting. The form is to be used for assessing wetlands where any disturbance is to take place.

Wetland Impact Assessment

Prepared by: **Date of assessment:**

Wetland Characteristics

Water body name (if applicable): _____

Wetland area: _____ hectares - Location: ___¼ Sec___ Twp___ Rge___ W___

Wetland area: _____ hectares - Location: ___¼ Sec___ Twp___ Rge___ W___

Wetland area: _____ hectares - Location: ___¼ Sec___ Twp___ Rge___ W___

Contributing drainage area: _____ km^2

Water Survey of Canada sub basin code: _____

Note: The QWAES shall classify the wetland(s) by using ***either*** *the Cowardin or Stewart and Kantrud Wetland Classification Systems.*

Cowardin Wetland Classification:

Major class: _____

Sub class: _____

Water regime: _____

Water chemistry: _____

Stewart and Kantrud Wetland Classification:

Class I Ephemeral ponds: _____

Class II Temporary ponds: _____

Class III Seasonal ponds and lakes: _____

Class IV Semi-permanent ponds and lakes: _____

Class V Permanent ponds and lakes: _____

Class VI Alkali ponds and lakes: _____

Class VII Fen (alkaline bog) ponds: _____

Page 1

Riparian Area

Type: _____ Avg. width _____ m Total area _____ hectares

Surrounding land use: Natural ☐
Cropland ☐
Hay ☐
Pasture ☐
Industrial ☐
Residential ☐
Other ☐ _____

Referenced site photos attached: Yes ☐ No ☐
Historical aerial photos attached: Yes ☐ No ☐

Site Observations

Waterfowl: _____
Wetland dependent wildlife: _____
Fauna: _____
Rare or endangered species: _____
Other: _____

Wetland Function (Benefits):

Page 2

Proposed Development:

Location and proposed development plan:

(Insert or attach a development plan drawing)

Page 3

Development Description:

Avoid impacts? Yes ☐, if No ☐ (Why?)

Minimize impacts? Yes ☐, if No ☐ (Why?)

Wetland loss compensation? Yes ☐

Compensation Proposal:

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3.0 The restoration sites

Wetland restoration must be part of an overall plan (e.g. watershed wetland objective plan or North American Waterfowl Management Plan) to achieve long-term ecosystem preservation and wetland retention in Alberta. Wetlands to be restored should be located within a watershed that makes ecological sense. Ideally the sites should be adjacent to an existing protected wetland system either as an added component to a fragmented flood plain system, or a protected mosaic of upland and wetland systems.

Locations selected for wetland restoration must be approved by Alberta Environment. It is the responsibility of the wetland restoration agency to determine if the area selected for restoration can support a wetland. This is in accordance with the criteria specified in section 3.2. The agency reports back to Alberta Environment. If a proposed site cannot support a wetland, the responsibility to fix or replace the site with an alternate site rests with the agency.

Under the requirements of the *Water Act*, the wetland restoration agency should submit the following information to Alberta Environment:

1. Application for an approval and/or licence as applicable
2. A detailed plan showing the layout of the project, including engineering details of the impoundment structure, contour map of the land to be flooded, the flood storage elevation and outlet structure (if required)
3. Certificates of Title for all affected lands
4. Landowner agreements, where necessary
5. Other information as requested by the Director

3.1 Benefits of an inventory system for WRAs

Agencies responsible for restoring wetlands and habitat should develop an inventory of drained naturally occurring wetlands that are candidates for restoration.

The cost of restoring these wetlands is known up front and can be used to establish the cost of compensation options. Funds generated by this method will be applied directly to the restoration of these drained or altered wetlands. Once restored, these wetlands are removed from the wetland restoration site inventory listing and are then added to the overall provincial wetland inventory.

3.2 Criteria for determining wetland restoration sites

For an area to be considered a potential restoration site, it must either be an individual or complex of drained or altered naturally occurring wetlands types defined as ephemeral, seasonal, temporary, semi-permanent and permanent wetlands or any combination thereof. These watersheds possess the long-term capability to function as healthy aquatic ecosystems as recognized within *Water for Life: Alberta's Strategy for Sustainability*.

Proposed restoration projects are added to the candidate site list through continual, proactive wetland restoration efforts by the wetland restoration agency.

3.3 Site inventories

Ducks Unlimited Canada keeps an inventory of drained wetlands in the province. The inventory is used to identify opportunities for wetland restoration sites and to maintain a record of compensation sites.

Ducks Unlimited Canada uses the inventory to ensure that the most critical wetlands are restored. Keeping a record of wetland restoration sites is also a requirement of *Water for Life*: Alberta's Strategy for Sustainability. The Alberta Government is working on this development in partnership with the North American Waterfowl Management Plan.

3.4 Managing and maintaining restored wetland areas

Once sites have been completely compensated for they will be managed by the wetland restoration agency in accordance with *Water Act* approval requirements.

Once sites have been restored they are monitored annually with maintenance or repairs conducted as required by the agency.

3.5 Auditing

The wetland restoration agency is responsible for providing Alberta Environment's Evaluation and Monitoring Branch with an annual report of wetland compensation activities for auditing purposes. The report will cover the following areas:

- Evidence that restored sites are properly functioning wetlands
- Cost of restoring the wetlands
- Full accounting of income and expended dollars including dollars generated from other sources
- Inventory of wetlands to be restored
- Other information as required

Referenced Material

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetland and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm (Version 04DEC98).

Stewart, Robert E. and Harold A. Kantrud. 1971. Classification of natural ponds and lakes in the glaciated prairie region. Resource Publication 92, Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/tools/pondlake/pondlake.htm (Version 16APR98).

Additional Reading

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